

## Description

# PLANT DISPLAY SYSTEM

### BACKGROUND OF INVENTION

- [0001] This application is a continuation in part from serial number 10/613,770 filed on July 2, 2003.
- [0002] Garden centers, nurseries, florists and other places where flowers, plants and trees are sold or displayed use display stands for the display of those plants. These display stands may be simply tables, but more often are designed not only to display the plants but to provide watering for those plants as well.
- [0003] One problem with the existing display stands is the bulk of the stands. Since access is normally provided on both sides of the display stands, these stands tend to take up considerable space. This is particularly a problem when the display stands are used for seasonal displays. Once the seasonal display is no longer needed, the space occupied by the display stands is wasted. Since space is typically at a premium, these display stands are an expense that must be borne by the center. Additionally, the empty

display stands are unappealing. While the display stands may be used for other purposes, this use is typically inefficient.

- [0004] Many garden centers, nurseries, florists, etc. also use hanging displays to display their plants. Since display space is at a premium, it is often useful to combine the display stands and hanging displays.
- [0005] The display of plants requires frequent watering of these plants to maintain their appearance. Often, it is difficult to maintain a regular schedule of watering due to staffing, shifts, uneven temperature and humidity fluctuations and other problems. Further, hand watering of the plants is often uneven, not only in time but in amount as well. This can lead to deterioration of the plants. Automated watering systems have been used in the past, but these tend to be expensive and complicated to operate.
- [0006] Typical watering practices for display plants tends to be surface watering. Many plants prefer bottom watering as opposed to surface watering. The use of surface watering on such plants may not allow the appropriate water to the root structure of such plants. Also, some plants on the same display require less water than others.
- [0007] Self watering planters have been developed to address

these issues. However, the typical self watering planter is designed for an individual plant, thus requiring special planters for each individual plant. This can be quite expensive for large displays. Also, this limits the choices available for the individual plants in regard to color, size, shape, etc. for the displays. The self watering planters must also be connected to a water supply, thus increasing the expense and limiting the arrangement of the display.

- [0008] A particular type of self watering planter has been developed to overcome some of these problems. This type of self watering planter is referred to as a capillary system. A capillary material, such as a spandex material, polyethylene or other materials that will wick moisture is placed on a table, bench or even in the bottom of a plant container. The end of the capillary material is dipped into a water trough or water supply to allow water to be wicked up next to the plant roots to supply water to the plant. Examples of these systems are disclosed in U.S. Patent Nos. 5,189,834; 5,673,511; 5,839,659; and 6,079,156.
- [0009] A problem with systems such as these is that the water is wicked up unevenly. The water is immediately absorbed through capillary action by the material nearest the water supply, and less water is available at locations distant

from the water supply. This leads to uneven water distribution among plants located on the capillary mat.

- [0010] Thus a need exists for a plant watering system for providing even distribution of water to plants on a display table or bench.

## SUMMARY OF INVENTION

- [0011] The present invention provides solutions to these and other needs by providing a display structure for use in garden centers, nurseries as well as other retail centers. The display structure of the present invention is able to convert from use as an active display structure to a compact storage position.

- [0012] In a preferred embodiment of the present invention, the display structure includes several display cases for displaying plants, flowers, and other items. The display cases are able to pivot from the horizontal display position to a vertical position for storage. This enables the space that was occupied by the display cases to be utilized for other floor displays, such as Christmas trees, or other seasonal displays. The display structures may also be stacked together for storage as well.

- [0013] In another embodiment of the present invention, the display structures provide an elongated bracket for support-

ing hanging plants. The bracket also includes clips for holding a misting tube for watering plants.

- [0014] In another embodiment of the present invention, the system provides a self watering system for display structures for plants. The system of the present invention provides a watering system for an attractive display for retail and wholesale sales of plants. The system of a preferred embodiment of the present invention allows plants to self water and maintain themselves without the intervention of workers.
- [0015] In a preferred embodiment of the present invention, the system provides a display structure that self waters plants without the need of special plant containers. Ordinary plant containers of any size, shape and color may be used as long as they have a typical drain hole on the bottom or sides of the container. The plants may be moved or replaced without concern.
- [0016] The system of a preferred embodiment provides a self watering system that is clean and attractive and does not detract from the display of the plants. The self watering system is hidden and not visible to customers.
- [0017] The system of a preferred embodiment is simple and does not require expensive controls or equipment that would

require constant maintenance. Once the system is setup, it is simple to maintain and only occasionally requires maintenance.

- [0018] The system of the preferred embodiment includes a watertight top on a display structure. A reservoir having a series of perforations forming a honeycomb pattern for holding water is placed in the top. A water supply pipe extends along one side of the top with perforations for providing water evenly across the reservoir. A capillary mat is placed over the reservoir for absorbing water from the reservoir. Plants are then placed on the capillary mat. The potting media absorbs water from the capillary mat as necessary and supplies the water to the plants root system.
- [0019] Water is supplied evenly to all parts of the capillary mat so that plants are able to self water without regard to their location on the display structure. The reservoir is able to support the capillary mat and plants without the capillary mat sitting in the water itself.
- [0020] In another embodiment of the present invention, the top includes corner trim members that provide waterproofing for the top. The corner trim also provides safety protection and aesthetic considerations as well.

[0021] These and other features of the present invention are evident from the ensuing description of preferred embodiments and from the drawings.

## BRIEF DESCRIPTION OF DRAWINGS

- [0022] Figure 1 illustrates a display structure for plants of a preferred embodiment of the present invention.
- [0023] Figure 2 illustrates an end view of the display structure of the embodiment of Figure 1.
- [0024] Figure 3 illustrates the pivoting display case of the embodiment of Figure 1.
- [0025] Figure 4 illustrates an end view of Figure 3.
- [0026] Figure 5 illustrates an end view of the display cases pivoted in a vertical orientation.
- [0027] Figure 6 is a perspective view of Figure 5.
- [0028] Figure 7 is another preferred embodiment of the display structure of the present invention.
- [0029] Figure 8 is a perspective view of the embodiment of Figure 7 with the display cases in a vertical orientation.
- [0030] Figure 9 is a cut away view of the support bracket of a preferred embodiment of the present invention.
- [0031] Figure 10 is a perspective view of the support bracket of the embodiment of Figure 9.

- [0032] Figure 11 is an end view of the support bracket of the embodiment of Figure 9.
- [0033] Figure 12 is an end view of the support bracket system of the embodiment of Figure 9.
- [0034] Figure 13 is a preferred embodiment of a table watering system.
- [0035] Figure 14 is a preferred embodiment of the capillary water system.
- [0036] Figure 15 is a detail view of the embodiment of Figure 14.
- [0037] Figure 16 is another view of the embodiment of Figure 14.

#### **DETAILED DESCRIPTION**

- [0038] The present invention provides a system for providing an attractive display for plants that also allows for the watering of plants in a clean environment through capillary action. It is to be expressly understood that the descriptive embodiments set forth herein are intended for explanatory purposes and is not intended to unduly limit the scope of the claimed inventions. Other embodiments and applications not described herein are considered to be within the scope of the invention. It is also to be expressly understood that while specific embodiments for the components of the system are discussed, other equivalents to

these embodiments that perform substantially similar functions are within the scope of the claimed inventions.

[0039] A preferred embodiment of the present invention is illustrated in Figures 1 5. The display stand 10 of this embodiment includes a rigid frame 20 having vertical members 22, 24, 26, 28 mounted on a lower base stand 30. Lower base stand includes cross members 32, 34 and vertical base members 36, 38, 40, 42, 44, 46. Angled support members 48, 50, 52, 54 also secure vertical members 22 28 to lower base stand 30. Cross members 60, 62, 64, 66 also support vertical members 22 28.

[0040] Display cases 70, 72 are secured to the lower base stand 30 by pivotal attachment mechanism 74, 76, 78, 80. These pivotal attachment mechanisms may include bolt and nut attachments, rivets, or any other mechanism that will secure the display cases to the lower base stand while allowing for pivoting movement of the display cases relative to the lower base stand. Detent mechanisms are provided on the lower base unit to hold the display cases 70, 72 in place relative to the lower base unit when in the horizontal position.

[0041] Display case 82 is also secured to the cross members 60, 62 by pivot attachment mechanisms 84, 86. The display

case is thus secured to the display stand while pivotal relative to the cross members. A detent mechanism is also provided to secure the display case 82 in place relative to the display stand when the display case is in the horizontal position.

- [0042] In this preferred embodiment, structure members 90, 92 and 94, 96 are secured to the upper end of the display stand on the vertical members 22 28. Hanging plants may be mounted from these structure members or display cases may be mounted to these structure members. In this embodiment, the structure members or display cases are mounted permanently at an angle, although in other embodiments, the tops may be pivotally mounted as well.
- [0043] In use, the display stand 10 is set up as shown in Figures 1 and 2. Since many of the plant displays are seasonal, the stand is not always needed. In that situation, the display cases 70, 72, and 82 are simply rotated upwards toward the center of the display stand, as shown in Figures 3 6. Once the display cases are perpendicular to the ground, as shown in Figure 5, additional space is freed to allow the display stands to be stored away, or other displays placed where the display cases had been formerly.
- [0044] Another feature in a preferred embodiment of the present

invention is the ability to attach additional display stands to one another. As shown in Figure 7, display stand 100 is attached integrally to display stand 10. Display case 182 is pivotally secured between vertical members 28, 30 of display stand 10 and vertical members 120, 122. Similarly, lower display cases 170, 172 are pivotally attached to lower base unit vertical members 42, 44, 46 and lower base unit vertical members 142, 144, 146. The upper structure members or display cases 190, 192 are secured between the upper end of vertical members 28, 30 and vertical members 128, 130.

- [0045] The display cases 170, 172, 182 are able to pivot into a vertical orientation in a manner similar to display cases 70, 72, 82. As shown in Figure 8, the display cases 70, 72, 82, 170, 172, 182 are pivoted vertically upward when they are no longer needed. This provides additional space for other displays or for storage.
- [0046] Another feature of another preferred embodiment of the present invention is the misting hanging bracket 200, shown in Figures 2, 4, 5, 9, 10 and 11. The bracket 200, as shown in greater detail in Figures 9 – 11, includes an extruded aluminum elongated section 202. The bracket 200 is open on the lower end 204 to allow access to clip

members 206, 208 formed on the inside upper portion of the bracket. The clip members 206, 208 are spaced apart sufficiently to receive a misting tube (not shown). The misting tube 220, as is well known in plant and produce displays, includes a series of spaced perforations that are sized to cause water under pressure to mist over the displays. The resilient nature of the misting tube interact with the clip members to secure the misting tube in the bracket, or the clip members may be slightly angled inward to secure the misting tube.

- [0047] The upper outside portion 210 of the bracket 200 provides a support for hanging plants, as shown in Figure 11. The structural integrity of the bracket 200 is able to carry the weight of a plurality of hanging baskets filled with plants. The misting action from the misting tube provides water and humidity for the plants that are hung from the support bracket 200.
- [0048] It is to be expressly understood that the support bracket has utility separately from the above described embodiments of display stands as well as the below described watering system. It may be used alone or in combination with other display mechanisms.
- [0049] In this preferred embodiment, the bracket 200 is attached

to the lower or side surface of a display case, such as display cases 90, 92. This allows the support bracket to support a number of hanging baskets, providing misting and watering to those plants as well as providing misting to plants on the display cases 70, 72 and 82. The angled surfaces 212, 214 and the flat upper surface on the outer surfaces of the bracket provide mounting surfaces onto the lower surface of the display cases 90, 92 or underneath cabinets, produce displays or many other structures.

- [0050] Another preferred embodiment of the present invention is illustrated in Figures 12 13. The watering system 310 is incorporated into a table or bench 312. The table 312 can be used as a stand alone display or connected to other tables, such as tables 314, 316. Also, additional tables can be interconnected end to end as well to create a level or tiered display.
- [0051] The table 312 includes top 320 with an under carriage of legs 322, 324, 326, 328 to support the top. It is to be expressly understood that other shapes, sizes and configurations of tables, benches and tops can be used under the presently claimed invention. The top 320 includes a perimeter rail 330 that is watertight at the corners. The

top 320 also includes a bottom 332 that is connected to the perimeter rail in a watertight connection. In this preferred embodiment, the top 320 is formed from aluminum with welded connections, but other materials and connections could be used as well, including but not limited to plastic, wood, or any other suitable material.

- [0052] In an alternative preferred embodiment of the present invention shown in Figure 15, the top 320 includes a waterproof corner trim 400, formed from polyvinyl chloride, plastic, rubber or any other waterproof material, preferably in molded form. This corner trim 400 guards against leaking at the corner of the top as well as providing an aesthetic cover over the welded, riveted, molded, stamped or otherwise formed corner portion of the top. The corner trim 400 also provides protection from accidental scraping against any sharp or rough edges on the top.
- [0053] Reservoir 340, shown in Figures 13, 14 and 15 is placed on the bottom surface 332 of the top 320 between the perimeter rails 330. The reservoir 340 includes a perforated material formed of a honeycomb material, such as plastic, rubber, metallic or any other suitable material. The perforations 342 or honeycombs are evenly spaced across the top of the table. The perforations may be cylin-

drical, or in one preferred embodiment includes one or more layers of a mesh material. This minimizes stagnation and pollution of water that may be in the reservoir for some time.

- [0054] It is to be expressly understood that the reservoir could also include other water containing mechanisms, such as horizontal channels, or even a sponge like material that is firm enough to support the capillary mat and plants contained thereon.
- [0055] Supply pipe 344 extends across one side of the top 320 and is connected 346 through either the undersurface, side or over the rails 30 of the top to a water source. The supply pipe 344 includes a series of evenly spaced perforations 48. In this preferred embodiment, the top 320 also includes stand pipes 350 in opposing corners of the top 320 to prevent overfilling of the top 320.
- [0056] The water supply pipe 342 can be connected to a water hose or plumbed to a permanent connection. The water supply pipe 42 can also be interconnected to water supply pipes on additional display tables as well.
- [0057] Capillary mat 360 is placed over the honeycomb reservoir 340, as shown in Figure 4. In the preferred embodiment, capillary mat is formed from a woven barrier fabric that

will wick water and other fluids evenly upward from the honeycomb reservoir. It is to be expressly understood that other materials may be used as well, including spandex, polyethylene and other woven or materials that are suitable for wicking water. Also, mesh material may be used that is resistant to organic growth to minimize contamination, bacteria, fungus or other organic growth that may result from standing water and from the plants.

- [0058] In use, plants in containers filled with potting media, soil or other organic bases are placed on the capillary mat 350. Water is provided through the supply pipe 342. The water flows through the perforations 348 evenly into the reservoir 340 until the reservoir is filled with water. The capillary mat absorbs the water until it is saturated. The potting media in the plant container absorbs the water through existing drain holes in the plant container to make it available to plant roots. This constant source of water allows the plant to self water for days without the need to refill the reservoir or the need for special attention as normal plant watering requires.
- [0059] The reservoir 340 provides water uniformly across the capillary mat so that all plants on the top 20 are able to have a uniform source of water. The reservoir also keeps

the capillary mat from sitting directly in the water.

- [0060] The reservoir may be filled either until water spills into the stand pipes, a preset amount of time or a timer or fill control mechanism may be used to provide automatic watering.
- [0061] The use of the system of the present invention enables the plants to be self watering in an attractive and clean environment. There is no need for special containers or special equipment beyond the system as discussed above. The system allows plants to be displayed in an attractive manner in a healthy environment without the constant intervention of workers.
- [0062] It is to be expressly understood that other embodiments of the present invention are included in the claims. The above explanatory embodiments are provided for descriptive purposes only.